FISCAL FEDERALISM, DOLLARIZATION OF PUBLIC CONTRACTS AND THE EXCHANGE RATE REGIME

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Abstract

During the recent Argentinean crisis, many provinces experienced very dramatic fiscal imbalances. In front of the shortfall in their resources and in order to avoid the default, provincial governors issued bonds as a way to finance a part of their spending. These quasi-monies were used to pay their subsidies to the municipalities and the wages of the local functionaries. The latter found the quasi-monies as a way to compensate the shortfall in the means of payment in pesos. For this reason, the provincial bonds became new currencies, initiating a dangerous competition with the peso (unless they are imperfect substitutes) from the last semester of 2001 to the beginning of 2003. The problem of the cancellation of the provincial bonds found two different solutions. Some local governments chose to repurchase their bonds to their owners, when some others benefited from an help of the federal government in the context of a rescue package negotiated in march 2003.

It seems that a difference exists between these two exit options. The former was made possible by the existence of hydrocarbon concessions in some provinces, mainly those of Patagonia (in the west and in the south of the country). In the nineties, the property of the natural gas and oil reservoirs, indeed, was granted to the provinces. These last yielded the management of their hydrocarbon reserves to foreign private companies and obtained the payment of royalties in dollar terms. In the context of the Convertibility, this clause was no more than neutral for the provincial public finances, because one peso was equal to one dollar. However, since the end of the currency board (in January 2002), the dollar was very strongly appreciated. This outcome implied a sharp increase in the peso value of the commodity-induced resources of the Argentinean provinces. This allowed, in the provinces which benefited from it, to remove their deficits and to withdraw the local quasi-moneys from circulation.

We find this short story very informative for the future of the design of the policymaking processes in Argentina. The provinces which benefit from very substantial commodity-induced resources prefer clearly a floating exchange rate, which allow the peso to depreciate. This is a case for an endogenous definition of the exchange rate regime. Indeed, the agreement of the whole of the provinces is necessary in order to reform the *Coparticipación* (which is the Argentine tax-sharing system). This reform is a key element of the crisis resolution package negotiated between the Argentine federal government and the International Monetary Fund. More generally, the definition of a

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cooperative framework in the fiscal relations between the federal government and the provinces appears clearly necessary in order to ensure a better balance of the public finances, in the future.

It is difficult to estimate the benefit granted from the enforcement of an institution, but a sound and healthy fiscal federalism seems to have a high social value for the Argentineans. So, the federal government have, no solely, to prevent secessions in order to preserve national unity, but also to support the adhesion of the whole of the provinces to the cooperative framework of the collective structures of negotiation (such as the *Coparticipación* system). The purpose of these last is to ensure the cohesion of the country, which represent an invaluable social good.

So, we propose a game between the federal government and the provinces, in which the exchange rate regime, the tax-sharing regime and the denomination of public contracts are co-determined. The federal government defines some institutional rules, such as the exchange rate regime and the denomination of public contracts, without the provinces. The tax-sharing system is determined jointly by the federal government and by the provinces, but the latter can refuse the negotiation, if that increases its incomes. But it involves a cost.

The citizens take an advantage of an increase in the commodity-induced resources of their provinces, because that reduces the taxes, but they share the cost involved by the non-cooperative choice of the local government. If the utility of the median voter of the jurisdiction j is not maximal under the choice of the federal government, the local government refuse the negotiation and choose freely the denomination of public contracts. This non-cooperative outcome imply fiscal distress and, if the federal government choose a hard peg, leads to the collapse of the fixed exchange rate regime[2]. So, the exchange rate float, the local public contracts are dollarized and the tax-sharing system is in crisis.

Since the local governments have an exit option from the negotiation of the tax-sharing system reform, the choices of the exchange rate regime and of the denomination of public contracts are constrained by a condition of maximisation of the utility of the median voter in each extreme jurisdictions (typically those of Patagonia).

Résumé

Lors de la récente crise argentine, de nombreuses provinces ont connu des déséquilibres budgétaires conséquents. Face à une baisse brutale de leurs ressources et pour éviter le défaut de paiement, les gouverneurs provinciaux ont émis des bons afin de financer une partie des dépenses courantes. Ces quasi-monnaies ont été utilisées afin de verser les dotations aux municipalités, ainsi que les salaires des fonctionnaires locaux. Ces derniers ont considéré ces quasi-monnaies comment un moyen de compenser le manque de moyens de paiement en pesos. Pour cette raison, les bons provinciaux sont devenus de nouvelles monnaies, concurrençant de manière dangereuse le peso (même si elles n'en étaient que des substituts imparfaits) du dernier semestre de 2001 jusqu'au début de 2003. Le problème de l'annulation des bons provinciaux a trouvé deux solutions différentes. Certains gouvernements locaux ont choisi de racheter leurs bons à leurs détenteurs, quand certains autres ont bénéficié de l'aide du gouvernement fédéral, dans le contexte d'un plan de soutien financier négocié en mars 2003.

Il semble exister une importante différence entre ces deux options de sortie de crise. La première a été rendue possible par l'existence de concessions d'hydrocarbures dans certaines provinces, particulièrement celles de Patagonie (dans l'ouest et dans le sud du pays). Dans les années quatre-vingt-dix, la propriété des réserves de pétrole et de gaz naturel a été cédée aux provinces. Ces dernières ont confié la gestion de leurs réserves d'hydrocarbures à des compagnies privées étrangères et en ont obtenu le paiement de redevances en dollars. Dans le contexte de la Convertibilité, cette clause était neutre pour les finances publiques provinciales, parce qu'un peso équivalait à un dollar. Toutefois,

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[2] Under the theory of Functional Finance, the choice of a fixed exchange rate regime requires a countercyclical fiscal policy. In a non-cooperative framework, this condition is not valid and the hard peg collapse.

depuis la fin du régime de caisse d'émission (en janvier 2002), le dollar s'est très fortement apprécié. Cette situation a impliqué une forte augmentation de la valeur en pesos des ressources des provinces argentines liées aux matières premières. Ceci a permis, dans les provinces qui en ont bénéficiées, de réduire les déficits et de retirer les quasi-monnaies locales de la circulation.

Nous considérons ce récent exemple très informatif sur ce que pourrait devenir la formation des processus de décision politiques en Argentine. Les provinces qui bénéficient de ressources liées aux matières premières très substantielles préfèrent clairement un taux de change flottant, qui autorise une dépréciation du peso. Ceci peut permettre d'endogénéiser le choix du régime de change. En effet, l'accord de l'ensemble des provinces est nécessaire afin de réformer la *Coparticipación* (qui est le système argentin de partage de recettes fiscales). Cette réforme est un élément clé du programme de résolution de la crise négocié par le gouvernement fédéral argentin avec le Fonds Monétaire International. Plus généralement, la définition d'un cadre coopératif dans les relations fiscales entre le gouvernement fédéral et les provinces apparaît indubitablement nécessaire afin d'assurer un meilleur équilibre des finances publiques, dans l'avenir.

Il est délicat d'estimer les avantages retirés du renforcement d'une institution, mais un fédéralisme fiscal sain apparaît avoir une valeur sociale élevée pour les argentins. Donc, le gouvernement fédéral ne doit pas, simplement, éviter les sécessions afin de préserver l'unité nationale, mais aussi favoriser l'adhésion de l'ensemble des provinces au cadre coopératif des structures collectives de négociation (telles que le système de *Coparticipación*). Le but de ce dernier est d'assurer la cohésion du pays, qui représente un bien social inestimable.

Nous proposons, donc, de formaliser un jeu entre le gouvernement fédéral et les provinces, dans lequel le régime de change, le système de partage des recettes fiscales et la monnaie de libellé des contrats de concessions sont co-déterminés. Le gouvernement fédéral définit certaines règles institutionnelles, telles que le régime de change et la monnaie de libellé des contrats de concession, sans les provinces. Le système de partage des recettes fiscales est choisi conjointement par le gouvernement fédéral et par les provinces, mais ces dernières peuvent refuser la négociation, si cela accroît leurs ressources. Mais cela implique un coût.

Les citoyens trouvent un avantage à l'augmentation des ressources liées aux matières premières de leur province, parce que cela réduit leurs impôts, mais il subissent le coût lié au choix non-coopératif du gouvernement local. Si l'utilité du voteur médian de la juridiction j n'est pas maximale selon le choix du gouvernement fédéral, le gouvernement local refuse la négociation et choisit librement la monnaie de libellé des contrats de concession. Ce résultat non-coopératif implique des déséquilibres fiscaux et, si le gouvernement choisit un régime d'ancrage rigide, aboutit à l'abandon du régime de change fixe[3]. Donc, le taux de change fluctue, les contrats de concession locaux sont dollarisés et le système de partage des recettes fiscales est en crise.

Du fait de la détention, par les provinces, d'une "option" de rupture de la négociation sur la réforme du système de partage des recettes fiscales, les choix du régime de change et de la monnaie de libellé des contrats de concession sont contraints par une condition de maximisation de l'utilité du voteur médian dans les juridictions les plus éloignées du centre (donc celles de Patagonie).

Mots-clés : *Fédéralisme Budgétaire; Voteur Médian; Dollarisation des Contrats; Régimes de Change.*

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[3] Selon la théorie de la Finance Fonctionnelle, le choix d'un régime de change fixe requiert une politique budgétaire contra-cyclique. Dans un cadre non-coopératif, cette condition n'est pas remplie et le régime d'ancrage rigide périclite.

Introduction

Up until the late 1990s, Argentina appears as an extraordinary economic miracle in the newspapers, but also in some reports of the International Monetary Fund. In the line of this early literature, the recent Argentinean crisis was the consequence of others emerging markets crisis. The access of the whole of the emerging borrowers to the international capital markets was deteriorated. Moreover, the Brazilian crisis implied a misalignment of the Argentinean peso, due to the rigidity of the Currency Board mechanism.

However, some early "unpopular" literature pointed out some forgotten arguments. On one hand, the very inefficient structure of the Argentine fiscal federalism is one of these arguments. Schwartz and Liuksila (1997) or Saiegh and Tommasi (1998) are examples of papers that show the importance of the risks associated with the bad definition of the separation of powers between the federal government and the provinces. On the other hand, the rise in the levels of domestic and international debts was an other understressed phenomenon. It appears that these two arguments, bad federalism and overborrowing, are significatively and positively correlated and consistent with a credible explanation of the Argentinean crisis.

We could quote many inefficiencies in the imperfect separation of powers resulting from the Argentine federalism. But, in this study, we will restraint our analysis to two crucial questions. The first argument is that, within the framework of the Argentinean fiscal federalism, the tax-sharing regime between the provinces and the federal government is very distortive. Using a conventional model of monetary union, Chari and Kehoe (1998), we add some form of fiscal federalism. In their model Chari and Kehoe show that *"if the monetary authority cannot commit, there is a free-rider problem in fiscal policy, and fiscal constraints may be desirable"*. Our purpose, here, is to show that a badly defined tax-sharing principle implies some form of provincial fiscal profligacy. So, we use the framework of Chari and Kehoe, but our story is different.

At various points of the Argentinean monetary history, some provincial governors chose to issue low denomination provincial bonds (quasi-monies). We argue that this de facto monetary fragmentation is the consequence of a de jure unproperly defined separation of powers between national and subnational levels of government. The legitimacy of the rules results from a process of negotiation, but also of conflicts between these two levels of government.

Our second argument is related to the asymmetric possibility to collect dollarized resources for some provinces. The existence of hydrocarbon concessions in some provinces of Patagonia, managed by foreign private companies, implied the payment of dollarized royalties. So, modifying the model of Panizza (1999), we find an incitation to choose a floating exchange rate regime.

1. The Argentine Fiscal Crisis

Since the independence, Argentina suffered from many fiscal crises. The hardest are, undoubtedly, the episodes of the "Banco de Descuentos" in 1822, or of the ley de "Bancos Garantizados" in 1890. More recently, we can quote the *Coparticipación* reform failure in 1985 or the recent crisis in 2001. The common point of the whole of these crises was the existence of conflicts between the federal State and the provinces, inducing the existence of major deficits in these lasts.

1.1 Fiscal Federalism : Argentinean Style

In the first part of the nineteenth century, the domination of Buenos Aires exacerbated some tensions between these last and the provinces. This situation implied the existence of tariffs on intranational trade and the necessity of the adoption of a federal separation of powers. Since the constitution of 1853, based on the Tocqueville's doctrine, Argentina is a federation of 23 (+1)[4] provinces. Trade policy became the monopoly of the federal government but, between 1853 and 1935, there was not any tax-sharing system of the others revenues from taxes. However, the crisis of the thirties, by causing the trade to stop and the incomes of the federal government to decrease, implied the creation of the *Coparticipación federal de impuestos*. Within this new system, the federal government and the provinces decided to share their fiscal resources in order to ensure a better solidarity between these two levels of government.

In order to finance the *Coparticipación federal de impuestos* mechanism, some new federal taxes were created instead of provincial taxes, that the provinces were committed to remove. The product of the newly *coparticipated* taxes was therefore shared between the federal and the provincial governments. The share of the *coparticipated* taxes obtained by each province would depend, consequently, of its population or its income per capita. Geographic concerns are also considered[5]. However, the federal State, at the root of the system, organizes the tax collection and the revenue allocation.

The *Coparticipación* reform of 1988 established that the provinces obtain 57% of the revenue from the *coparticipated* taxes (*primary coparticipación*), while the federal government retains 42%. The remaining 1% is used to constitute the reserve fund "*Aportes del Tesoro Nacional*" in order to finance discretionary distributions of money to the provinces in times of stress. The law defines a *secondary coparticipación* tax sharing principle, as a basis to define the share of the *primary coparticipación* distributed to each of the provinces. At the provincial level, a system of *coparticipación* exists between the provincial government and the municipalities[6].

1.2 Provincial Mismatches

According to Tommasi (2002), in Argentina, the provinces represent approximately 40% of the total consolidated public sector expenditures. However, the constitution of a common pool of taxes, like the *coparticipación* mechanism, implies a mismatch between provincial expenditures and provincial tax collection. According to Saiegh and Tommasi (1999), between 1985 and 1995, the own resources represented only one third of the provincial expenditures, the remainder coming from federal resources or from borrowing. After the negotiation of the two fiscal pacts of 1992-1993 and the amendment to the constitution of 1994, this proportion increased. According to Tommasi (2002), in 2000, 44% of the total provincial resources came from provincial revenues. So, the so-called vertical fiscal imbalance (the percentage of the resources received from *coparticipated* taxes or others federal funds over total resources) represented 56%. While disaggregating, we can notice that this dependence is unequal. For example, the City of Buenos receives 8% of its resources from the common pool of national taxes whereas this rate reaches 95% for the province of Formosa. More generally, only nine of the 24 provinces collect more than 70% of their total resources.

In addition, the redistribution operated through the *coparticipación* system is not efficient. Income inequalities are badly taken into account, since the share of each province

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[4] Because of the federalization of the City of Buenos Aires.
[5] For example, peripheral provinces (like those of Patagonia) benefit from more *coparticipated* taxes.
[6] Sanguinetti et alii (2000).

depends on its income per capita, in order to allow an interregional redistribution. However, the statistics, in each province, hide strong disparities. In fact, poverty is significant in the province of Buenos Aires, whereas its inhabitants are net contributors to the *coparticipación* system. Moreover, the structure of taxation appears very distortive. For example, according to Saiegh, Sanguinetti and Tommasi (2001), the labor is particularly burdened in a country where the rate of unemployment is very high.

At the provincial level, we can quote an unambiguous asimmetry between the rich and the poor. The less is the provincial GDP per capita, the higher is the vertical fiscal imbalance. Moreover, according to Saiegh, Sanguinetti and Tommasi (2001), if we consider the ratio of provincial tax income in percent of provincial GDP, we can see that the tax collection is unambiguously weaker in the poor (or *coparticipación* "addicted") provinces like Corrientes, Formosa or La Rioja[7]. But, this ratio is very high in the provinces which benefit from the existence of hydrocarbon concessions, like in Neuquén or Santa Cruz[8]. (See Figures 1 and 2).

The 1992 fiscal pact appeared to increase the existing provincial mismatches, while exacerbating the procyclicality of both provincial and federal public finances. Fifteen percent of *coparticipación* revenues were diverted, in order to finance the reform of the national social security system. The pay-as-you-go system was gradually replaced by a new pension system. Individual capitalized accounts administered by companies known as AFJPs were created. However, this system coexisted with the old public pay-as-you-go system. The workers could choose their preferred system and, at all events, the federal government guaranteed the payment of the pensions related to the pay-as-you-go system. So the young workers chose the new program administered by the AFJPs, and the old workers chose the pay-as-you-go system. This outcome implied an important mismatch for the federal government and the accumulation of a "social" debt which represent an important part of the defaulted debt of 2001.

In order to compensate the mechanical disminution of the *coparticipación* payments to the provinces, a guaranteed floor is established on the monthly payments. In the 1992 fiscal pact, it was set at 720 million and at 740 million in the 1993 fiscal pact. In times of recession, it is a very generous disposition, because the revenues from *coparticipated* taxes decrease sharply. This mechanism introduces some form of procyclicality in both provincial and federal public finances.

1.3 Debt Monetization and Demonetization

Two key elements of the 1992 fiscal pact, according to Tommasi (2002), were not fulfilled. These two elements lay out that, *"both the Federal Government and the provinces committed themselves not to increase their expenditures more than 10% above the 1992 current expenditure"* and that *"provinces would ask their legislatures to sanction balanced budgets"*. During the second mandate of Menem, the federal and provincial fiscal deficits grew rapidly in a context of recession and reduction of international capital flows towards emerging markets.

During the nineties, provincial deficits were financed mainly by the way of provincial state banks. So, provincial governments had no incentives to reduce their fiscal profligacy, because they have a mechanical source of financing. In addition, provincial governments could finance their deficits by the way of loans to commercial banks and of provincial bonds collateralized with a pledge of *coparticipación* handled by the Banco de la Nación. So, an increase of collateralized provincial loans implies a decrease of the *coparticipated* revenues

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[7] The province of the former president Menem.
[8] The province of the actual president Kirchner.

really reassigned to the provinces. For example, in 2000, the percentage of *coparticipación* revenues diverted from the province of Tucumán is equal to 85%[9], when the ratio of provincial tax income over provincial GDP is equal to 4,13%. In addition, the vertical fiscal imbalance is equal to 75% of total resources[10].

The combination between an increasing addiction to the *coparticipación* revenues and to an increasingly expensive debt[11] was observed in the majority of the provinces. Moreover, since 1999, the revenues from taxes of the federal State and of the provinces decreased, because of the recession. So, the provincial fiscal deficits rose (see Figure 3), the levels of indebtedness grew rapidly and at the end of the first semester of 2001, the federal government faced a credit crunch. In order to solve this shortfall of resources, the federal ministry of economy D. Cavallo chose to present his "ley de deficit cero". The consequence of this commitment was the inability of the federal government to pay to the provinces, the monthly *coparticipación* transfers.

In front of the shortfall in their resources and in order to avoid the default, provincial governors issued bonds as a way to finance a part of their spending[12]. These quasi-monies were used to pay their subsidies to the municipalities and the wages of the local functionaries. The latter found the quasi-monies as a way to compensate the shortfall in the means of payment in pesos. For this reason, the provincial bonds became new currencies, initiating a dangerous competition with the peso (unless they are imperfect substitutes) from the last semester of 2001 to the beginning of 2003, as shown in Figure 4. In addition, the federal government chose rapidly to create his own quasi-money, the LECOP[13], in order to cover the *coparticipated* revenues shortfall and to solve provincial fiscal distress. As shown in Tables 1 and 2, the quasi-monies represented a very important share of the currency circulation, both at the provincial and at the federal levels.

The problem of the cancellation of the provincial bonds found two different solutions. Some local governments chose to repurchase their bonds to their owners, when some others benefited from an help of the federal government in the context of a rescue package negotiated in march 2003[14].

It seems that a difference exists between these two exit options. The former was made possible by the existence of hydrocarbon concessions in some provinces, mainly those of Patagonia[15] (in the west and in the south of the country). In the nineties, the property of the natural gas and oil reservoirs, indeed, was granted to the provinces. These last yielded the management of their hydrocarbon reserves to foreign private companies and obtained the payment of royalties in dollar terms. In the context of the Convertibility, this clause was no more than neutral for the provincial public finances, because one peso was equal to one dollar. However, since the end of the currency board (in January 2002), the dollar was very strongly appreciated. This outcome implied a sharp increase in the peso value of the commodity-induced resources of the Argentinean provinces, as shown in Figure 5. This allowed, in the provinces which benefited from it, to remove their deficits and to withdraw the local quasi-monies from circulation.

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[9] Tommasi (2002).

[10] Lora (2002) compares the performance of the tax systems in the Western Hemisphere and finds that the Argentina's system is very distortive and that the tax collection (relative to other countries of the western hemisphere) is very weak.

[11] Both in terms of credit spreads and in terms of diverted *coparticipación* flows.

[12] Firstly and Mainly, it was an initiative of the governor of the province of Buenos Aires (C. Ruckauf), who launched his Patacones at the end of july.

[13] Letras de Cancelación de Obligaciones Provinciales.

[14] Mainly the provinces which appear in Table 1.

[15] Misiones, San Juan, Tierra del Fuego, Chubut, Rio Negro.

2. Implications of Argentinean Fiscal Federalism for Monetary Sovereignty

It appears that the phenomenon of secular crisis of fiscal federalism in Argentina imply some threats to monetary sovereignty. The vulnerability of the federal government towards the non-cooperative attitude of the provinces has some consequences, in terms of loss of powers. Some prerogatives are normally, and constitutionally, the monopoly of the federal State, like trade policy or the monetary and the exchange rate regimes. But, in a *divided society*, like Argentina, the influence of the provinces implies, in fact, a separation of federal powers, between the federal government and the provinces.

2.1 What is "Monetary Sovereignty" ?

Since the start of the European experience of nation state in the middle of the nineteenth century, and the propagation of the Tocqueville's liberal doctrine, the world has changed. As a consequence the idea of monetary sovereignty grew rapidly in the twentieth century. We saw the proliferation of sovereign states[16] (especially emerging sovereigns) and, therefore, the proliferation of new monies. But the results of the process do not seem equal between the core and the periphery. A country of the core appears more sovereign than an other of the periphery[17]. This is particularly true in the monetary field. De facto dollarization appears to be the main threat to monetary sovereignty, but it is not the only one. Provincial quasi-monies deteriorate the exercise of sovereignty more deeply. In order to verify this assertion, we need a clear definition of monetary sovereignty.

In Argentina, like in others emerging economies, monetary instability is structural. For example, in Ecuador, this situation implied a decision of full dollarization. But, the Argentinean monetary authorities try to maintain and reinforce the monetary sovereignty of the country. We found a definition of monetary sovereignty in Blanc (2001), who establishes various criteria. He defines two levels of classification. The first imply a "weak" definition and the second a "strong" definition of monetary sovereignty.

In the "weak" definition, we find four criteria. An authority which affirms its sovereignty on the monetary field, creates a unit of account, collects seigniorage revenue and develops monetary symbols (like paper money or coins).

If we add four other criteria, we obtain the "strong" definition of monetary sovereignty. A sovereign monetary authority controls the internal practices of account and payment, as well as the practices of conversion between national currency and foreign currency and, also, has the possibility of following an autonomous monetary policy and an autonomous exchange rate policy. This second level of definition gives a more extensive vision of the concept of monetary sovereignty and makes possible to understand the difficulty, for a monetary authority, to be fully sovereign, even in a country such as the United States. The threats to the full exercise of monetary sovereignty can however be treated on a hierarchical basis according to their importance. Monetary policy is not completely autonomous, including in the developed countries. However, monetary sovereignty does not seem really disputed in these countries.

Currency competition on the internal practices of account and payment seems to threaten monetary sovereignty more directly. It deteriorates the "*national monetary exclusivity*" which supposes a single, exclusive and specific currency. The first criterion is related to the existence of only one currency in the country. The exclusivity implies that this currency covers, without currency competition, the whole of the field of the internal monetary practices. The last

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[16] See Braun, Hausmann and Pritchett (2003).
[17] On the Core-Periphery structure, see Bordo and Flandreau (2001).

criterion supposes that the national currency is only associated with the country where it is issued.

2.2 Threats to National Monetary Exclusivity

As Blanc (2001) point out, *national monetary exclusivity* and monetary sovereignty are closely linked. The use of currency, and its exclusiveness, is a function of the separation of powers in the country of issuance. The acceptance of currency is a positive function of the quality of the issuing authority. This conception is clearly Cartalist, as defined by Schumpeter (1950). If the quality, or the power, of the issuing authority declines, the use of the national currency declines too.

There are three convenient substitutes for a declining national currency. Firstly, if a credible monetary substitute does not exist[18], a declining quality of the issuing authority may imply a significant reversion towards barter. The modern form of (indirect) barter is done by the *Local Exchange Trading Systems* (LETS). The LETS are local, non-profit exchange networks in which all kinds of goods and services can be traded without the need for money. The *Creditos*, issued notably during the year 2002 in Argentina, are a good example of LETS. Under the Metallist theory[19], such a reversion is impossible, because the transactions costs are too expensive in barter. A Cartalist approach can better explain this result. Due to a significant decline of the power of the issuing authority, the use of the national currency declines too, and, due to the lack of credible substitutes, we observe a reversion towards barter.

The second alternative corresponds to the use of an international currency instead of the national currency for domestic transactions, the so-called dollarization phenomenon. According to Armas and Webb (2002), (de facto) *dollarization is a process in which the residents of a country substitute assets denominated in domestic currency (money and financial assets) for those denominated in foreign currency, to protect their financial wealth from inflation and domestic currency depreciation.* Currency substitution (the holding of foreign currency) leads to payment dollarization, when asset substitution (the holding of foreign currency assets) leads to financial dollarization. According to our "strong" definition of monetary sovereignty the currency substitution problem is more severe, because the monetary authority does not control the internal practices of account and payment. Since the Convertibility Law of 1991, and the end of inflation in Argentina, the growing problem was financial dollarization. The use of the Argentinean peso as a store of value declined, as a symptom of his perceived declining intertemporal stability.

The third alternative is the issuance of domestic (imperfect) monetary substitutes. The use of these substitutes is closely linked to the power of the issuing authorities, relative to the power of the issuing authority of the national currency. This competition between several currencies is closely linked to a bad vertical separation of powers between the federal State and the provinces. This idea is related to the concept of *divided society*. According to Cooper and Kempf (2001), a *divided society* is a country *in which special interest groups can pressure a weak central government to issue money to finance their own demands while neglecting the country's overall welfare.* In Argentina, the special interest groups are the provinces. These lasts issued low denomination bonds, the provincial quasi-monies. In this context, we can observe a phenomenon of competition on the internal practices of account and payment. This is an important threat to monetary sovereignty.

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[18] There is no other credible issuing authority.
[19] Menger (1892).

2.3 Soft Budget Constraints and Monetary Sovereignty

Our purpose, here, is to demonstrate that a procyclical tax sharing mechanism implies more deficits at the provincial level. We think that this was at the core of the recent Argentine fiscal crisis. We saw that the provincial fiscal distress implied an issue of quasi-monies, and consequently a threat to the Argentine monetary sovereignty due to a deterioration of the "*national monetary exclusivity*" principle.

An inadequate separation of powers between the provinces and the federal government (a situation of *divided society*) implies the existence of a procyclical tax sharing mechanism. So, in order to reduce provincial fiscal deficits, it appears important to elaborate a new tax sharing accord (a reform of the *coparticipación* mechanism), on a contracyclical basis.

Argentina can be analyzed as a Currency Union with a federal budget. The model presented in this section extends slightly the framework developed by Chari and Kehoe (98). They consider a non-cooperative and a cooperative regime. We choose the non-cooperative one and we add a procyclical fiscal transfer from the federal government to the provinces. Chari and Kehoe consider a two-period model with two identical (for simplicity) countries that are small in the world economy[20].

In each country (or province), the price level during the first period is P_0. Each province issues nominal debt in period 0 to lenders who live outside of the two provinces, and who are risk neutral and have discount factors λ. During the second period, the two countries choose to adopt a single currency. Then monetary policy is equivalent to the determination of the second period price level P_1. The two entities build some form of fiscal federalism. This new system imply a net allocation of k[21] (k^*) to each province in the second period. The output of the first period is equal to ω and the output of the second period is equal to y, in each province. Second period output is a decreasing and convex function of the inflation rate of the area from the first period to the second, $\pi = \dfrac{P_1}{P_0}$.

The budget constraints in country one are described by :

$$\begin{cases} P_0\, C_0 = \omega + qb \\ P_1\, C_1 = P_1\, y - b + k \end{cases}$$

Where b is nominal debt sold to foreign lenders at price q, C_0 and C_1 denote consumption in the first country. k is an increasing function of b (i.e. $k_b > 0$, i.e. k is procyclical[22]).

The objective function of the government is :

$$U(C_0) + \lambda\, U(C_1)$$

For simplicity, we set $P_0 = 1$ et $r = \dfrac{1}{\pi}$, where r is the share of nominal debt really repaid. y is an increasing and concave function of r.

Then :

$$C_1 = y(r) - r\,(b - k)$$

To have an incentive to borrow, we have to assume $\omega \ll y(1)$

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[20] We denote country (or province) 2 allocations with an asterisk.
[21] In this model k could represent ex-ante defined tax-sharing allocations but also discretionary transfers.
[22] We see in the first budget constraint that consumption is increasing in the debt level. Since k is increasing in b, k is procyclical.

The monetary authority's objective function is the sum of the two objective functions of the two governments. During the first period, the two provincial governments choose their debt levels, which implies q (the price of debt). During the second period, the monetary authority chooses the repayment rate r of the area. We consider, like Chari and Kehoe, a non-cooperative equilibrium in which the two provinces choose their debt levels to maximize their own objective functions.

We solve the model by backward induction. The monetary authority chooses r to solve :

$$\underset{r}{Max} = U\left[y(r) - r(b-k)\right] + U\left[y(r) - r\left(b^* - k^*\right)\right] \tag{1}$$

This implies r(b,b*), the debt repayment level, which is a decreasing function of the debt burden. So, the lenders choose the price of debt q to solve :

$$q\left(b,b^*\right) = \lambda\, r\left(b,b^*\right) \tag{2}$$

The first province government chooses b (taking b* as given) to solve :

$$\underset{b}{Max}\ U\ (\omega + q(b,b^*)\ b\ ) + \lambda\ U\ (\ y\ (r(b,b^*)) - r(b,b^*)\ (\ b - k(b)\ ) \tag{3}$$

Chari and Kehoe add an assumption on y :

$$y = \bar{y} - \frac{r^{-\sigma}}{\sigma} \tag{4}$$

In a symmetric equilibrium b = b*, so the equilibrium is the same in the two provinces.

By maximizing the utility function of Eq. (1), we obtain the first order condition of the monetary authority :

$$U'(C_1)(y_r - (b-k)) + U'\left(C_1^*\right)\left(y_r - \left(b^* - k^*\right)\right) = 0$$

Differentiating this FOC with respect to b, we obtain :

$$\frac{\partial r}{\partial b} = \frac{(1 - k_b)\left[U'(C_1) + r\, U''(C_1)(y_r - (b-k))\right]}{\left[U'(C_1)\, y_{rr} + U''(C_1)(y_r - (b-k))^2 + U'\left(C_1^*\right)y_{rr} + U''\left(C_1^*\right)\left(y_r - \left(b^* - k^*\right)\right)^2\right]} \tag{5}$$

In a symmetric equilibrium, the first order condition yields the following condition :

$$y_r = (b-k) = \left(b^* - k^*\right) \tag{6}$$

From (5) and (6), we can obtain :

$$\frac{\partial r}{\partial b} = \frac{(1 - k_b)}{2\, y_{rr}} \tag{7}$$

Solving the first order condition of the lenders yields to :

$$\frac{\partial q}{\partial b} = \lambda\, \frac{\partial r}{\partial b} \tag{8}$$

Finally, solving the first order condition of one provincial government yields the following condition :

$$\left[U'(C_0)q - \lambda r U'(C_1)\right] + U'(C_0)b\frac{\partial q}{\partial b} + \lambda\ U'(C_1)(y_r - b + k)\frac{\partial r}{\partial b} + \lambda\ U'(C_1)(k_b\, r) = 0 \tag{9}$$

With (2), (6), (7), and (8), we can reduce (9) to :

$$r\left[U'(C_0) - U'(C_1)\right] + U'(C_0)\frac{(y_r + k)(1 - k_b)}{2\,y_{rr}} + U'(C_1)(k_b\,r) = 0$$

$$\Leftrightarrow U'(C_0)\left[1 + \frac{(y_r + k)(1 - k_b)}{2\,r\,y_{rr}}\right] = U'(C_1)(1 - k_b)$$

With (4), we obtain :

$$\left[\frac{1}{1 - k_b} - \frac{1}{2}\frac{1}{1 + \sigma} - \frac{1}{2}\frac{1}{1 + \sigma}\frac{k}{r^{-\sigma - 1}}\right] = \frac{U'(y - r\,y_r)}{U'(\omega + \lambda\,r(y_r + k))} \tag{10}$$

So, it exists two solutions, depending on the sign of k_b. If k is positively correlated with b (the net allocation is increasing in nominal debt), the fiscal transfer is procyclical. This is typical of a situation of *divided society*. In the model C_0 is increasing in b. So, the allocation k is procyclical. If k is negatively correlated with b, the allocation is incentive compatible and consistent with a countercyclical scheme.

We can compare the value of (10) on the basis of these two assumptions. We assume that $\lambda\,rk$ is sufficiently small to appear innocuous[23]. From (4), it follows that $(y - ry_r)$ is increasing in r, and that the denominator of (10) is decreasing in r. So the right side of (10) is decreasing in r.

Since the left side of (10) is greater in the *divided society* equilibrium, since k_b is positive, we have :

$$\boxed{r_d < r_n}$$

r_d is the repayment function consistent with the *divided society* allocation, and r_n with a countercyclical allocation.

Since $y_r = b - k$ and y is concave, it implies, for a level of k, that :

$$\boxed{b_d > b_n}$$

With a procyclical contribution to the provinces, the level of indebtedness (ie the deficits) is higher.

What happens for the budget constraint of the federal government? In this model, the federal government is only, for simplification purposes, a provider of funds for the provinces. So, the aggregate federal fiscal deficit (or surplus) equals to $k + k^*$[24]. However, we can define a threshold level of deficits $\underline{k}$. Over this level, the federal government cannot borrow. The fiscal authority has to default on the debt, or on the *coparticipación* payments. The problem is that the provinces may not internalize the budget constraint of the federal government[25]. The risk of a shortfall in the coparticipated revenues is not anticipated by the provinces. So, the provincial levels of indebtedness are defined, according to the net allocations of the federal government to the provinces defined ex-ante. If, ex-post, the net allocation is smaller, each province has to default on his debt and/or to issue quasi-monies.

The *divided society* phenomenon is at the root of the structural weaknesses of the Argentinean fiscal federalism. In Argentina, this political fragmentation implies a recurrent

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[23] $0 < r < 1$ and k is small (it is a net allocation)

[24] When $k + k^*$ is positive, this is a deficit. When $k + k^*$ is negative, this is a surplus.

[25] I owe this terminology to comments provided by Lorenzo Forni.

monetary fragmentation, with the periodic issuance of provincial quasi-monies. These lasts appear when provincial fiscal profligacy meets a temporary break in *coparticipated* revenues and the inability to issue new debt. So, provincial governors issue low denomination bonds as a way to avoid the default, in order to pay the local functionaries and finance the transfers to the municipalities.

A countercyclical transfer appears necessary in order to enhance provincial financial stability, but the federal government cannot decide this reform without the agreement of the whole of the provinces, which seems difficult in a *divided society*.

3. Hard Constraints on Federal Government Choices

The model presented hereafter is a modified version of the framework developed by Panizza (1999), to an economy with two levels of government, one public good and one consumption good.

In our game, between the federal government and the provinces, the exchange rate regime, the tax-sharing regime and the denomination of public contracts are co-determined. The federal government defines some institutional rules, such as the exchange rate regime and the denomination of public contracts, without the provinces. The tax-sharing system is determined jointly by the federal government and by the provinces, but the latter can refuse the negotiation, if that increases its incomes. But it involves a cost.

The provinces which benefit from very substantial commodity-induced resources prefer clearly a floating exchange rate, which allow the peso to depreciate. This is a case for an endogenous definition of the exchange rate regime. Indeed, the agreement of the whole of the provinces is necessary in order to reform the *Coparticipación* (which is the Argentine tax-sharing system). This reform is a key element of the crisis resolution package negotiated between the Argentine federal government and the International Monetary Fund. More generally, the definition of a cooperative framework in the fiscal relations between the federal government and the provinces appears clearly necessary in order to ensure a better balance of the public finances, in the future.

It is difficult to estimate the benefit granted from the enforcement of an institution, but a sound and healthy fiscal federalism seems to have a high social value for the Argentineans. So, the federal government has, no solely, to prevent secessions in order to preserve national unity, but also to support the adhesion of the whole of the provinces to the cooperative framework of the collective structures of negotiation (such as the *Coparticipación* system). The purpose of these last is to ensure the cohesion of the country, which represents an invaluable social good.

In our model, the citizens take an advantage of an increase in the commodity-induced resources of their provinces, because that reduces the taxes, but they share the cost involved by the non-cooperative choice of the local government. If the utility of the median voter of the jurisdiction j is not maximal under the choice of the federal government, the local government refuses the negotiation and chooses freely the denomination of public contracts. This non-cooperative outcome implies fiscal distress and, if the federal government chooses a hard peg, leads to the collapse of the fixed exchange rate regime[26]. So, the exchange rate float, the local public contracts are dollarized and the tax-sharing system is in crisis.

Since the local governments has an exit option from the negotiation of the tax-sharing system reform, the choices of the exchange rate regime and of the denomination of public

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[26] Under the theory of Functional Finance, the choice of a fixed exchange rate regime requires a countercyclical fiscal policy. In a non-cooperative framework, this condition is not valid and the hard peg collapse.

contracts are constrained by a condition of maximization of the utility of the median voter in each extreme jurisdictions (typically those of Patagonia).

3.1 Fiscal Federalism with Decentralized Commodity-Induced Resources

In the model presented hereafter we consider an economy with two levels of government, one public good and one consumption good, and divided into J jurisdictions. The federal and provincial governments provide one public good G financed by local plus central taxes T and by (the peso value of) provincial commodity-induced resources R. In per capita levels, the government budget constraint is :

$$t + r = g \qquad (11)$$

All individuals have the same pre-tax income y and pay an identical lump-sum tax t. They are uniformly distributed over the territory and stratified according to their preferences for the public good. The existence of hydrocarbon concessions to foreign private companies implies the payment of royalties r to the provinces. Per capita private consumption c is equal to per capita disposable income :

$$c = y - t \qquad (12)$$

With (11), (12) reduces to :

$$c = y - g - r \qquad (13)$$

The individual i's utility is described by a distance-sensitive function :

$$U_i^A = g_i^{1-\alpha [\theta lim + (1-\theta)lij(1-\mu_i)]} c_i^{\beta} \qquad (14)$$

where g represents the per capita provision of public good, lim is the preference distance between individual i and the national median voter, lij the preference distance from the provincial median voter, θ the share of the public good that is provided by the federal government and μ_i the share of the provincial resources financed directly by provincial revenues. $\alpha \in [0,1]$ represents the difference in tastes across individuals. If $\alpha = 0$ the population is perfectly homogenous, but if $\alpha = 1$ the population is very heterogeneous. The policy of the local (national) government satisfies the preferences of the local (national) median voter.

The individual i's utility is negatively correlated with the level of centralization θ, the preference distance from the centre of the country lim (the province lij), and the differences in tastes α. However, decreasing the vertical fiscal imbalance (increasing μ_i) has the opposite effect, since the individual i prefers provincial resources than national taxes for two reasons. Provincial taxes appear to be less distortive than national taxes, because the individual i's distance from the local median voter is less important. Increasing provincial resources (relative to national taxes) decreases the vertical fiscal imbalance which is an important cause of fiscal profligacy. The share of the provincial resources financed directly by provincial revenues μ_i is given by :

$$\mu_i = \frac{P_{Ti} + R_i}{P_{Ti} + C_{Ti} + R_i} \qquad (15)$$

where P_{Ti} stands for provincial taxes and C_{Ti} for *coparticipated* taxes.

Individual i maximizes the distance-sensitive utility function subject to the budget constraint, derived from (13), $y_i = c_i + g_i - r_i$. If all individuals have the same income, the

budget constraint reduces to $y = c_i + g_i - r_i$. Solving the first order condition implies the following equilibrium levels of consumption :

$$g_i = \left[\frac{\delta_i + \rho_i}{\delta_i + \rho_i + \beta} \right] (y + r_i) \qquad (16)$$

$$c_i = \left[\frac{\beta}{\delta_i + \rho_i + \beta} \right] (y + r_i) \qquad (17)$$

where $\delta_i = 1 - \alpha \left(\theta \lim + (1 - \theta) \mathrm{lij} \right)$; $\alpha \left(\theta \lim + (1 - \theta) \mathrm{lij} \right)$ represents the distance between individual i's preferred public good allocation and the actual allocation ; and $\rho_i = \alpha \mu_i (1 - \theta) \mathrm{lij}$.

Then, we have :

$$\frac{\partial g_i}{\partial \delta_i} > 0 \quad (18) \qquad \frac{\partial c_i}{\partial \delta_i} < 0 \quad (19) \qquad \frac{\partial g_i}{\partial r_i} > 0 \quad (20) \qquad \frac{\partial c_i}{\partial r_i} \gtrless 0 ? \quad (21)$$

The impact of commodity-induced resources on the demand for the private good is not determined. The link is positive if an increase in this resources implies a substantial decrease in the dependence ratio from the centre (an increase in μ_i). So, it is more convenient to substitute commodity-induced resources to *coparticipated* taxes, than provincial taxes. But it seems clear, too, that all individuals prefer commodity-induced resources (paid by foreign firms) than provincial taxes.

3.2 *Coparticipación* Reform

Within the framework defined in the *Coparticipación* law, the repartition defined in the 1992 fiscal pact was consistent with the federal fiscal equilibrium, in good times. However, in times of stress, the tax collection is bad. So, the existing guaranteed floor on monthly *coparticipación* payments may imply an important deficit. With a not fully credible currency board system, like in Argentina, and even in the case of a stringent fiscal policy, the expectation of collapse of the hard peg leads a speculative crisis.

Thus, under the theory of functional finance, the choice of a fixed exchange rate regime requires a countercyclical fiscal policy. According to Corden (2002), functional finance is equivalent to a contractionary fiscal policy in good times (to moderate real appreciation), and an expansionary one in hard times (to moderate recessions).

If the government policy is procyclical in good times, the crisis is inevitable, even if the policy is countercyclical in hard times. The reasons to this outcome are the cost of recessions and the perceived inability to commit of the government. In a non-cooperative framework between federal and local governments, the condition of a permanent countercyclical policy is not valid and the hard peg collapse.

In emerging markets, even within a flexible exchange rate regime, fiscal policy must be countercyclical, because monetary and exchange rate policies are no more than innocuous. Moreover, the depreciation of the exchange rate, in times of recession, exacerbates the crisis because of the existence of significatives currency mismatches in the balance sheets of the government and the non-tradables.

So, it seems unambiguously clear that Argentina needs a reform of the *coparticipación* system, in order to reduce the contribution of the federal government to the provinces, because monthly *coparticipación* payments appear too expensive to allow a countercyclical federal fiscal policy. In our model, this is equivalent to a decrease of C_{Ti}. This decrease, with the

agreement of the whole of the provinces, implies an equivalent increase of μ_i (a decrease of the dependence ratio). In order to increase the resources financed directly by the provinces, two solutions exist. Increasing Ri is the first solution. If it is impossible, the provincial government may increase provincial taxes. However, if the coparticipación reform process fails, the default tax sharing mechanism remains the former.

3.3 Endogenous Dollarization Cum Float Equilibrium

It is clear that all individuals prefer an increase of commodity-induced resources, paid by foreign firms, than an increase of taxes (even provincial). However, the value of the royalties paid yearly to the local governments is negotiated through long-term contracts. The provinces or the federal governement cannot decide to modify unilaterally the terms of the contract. So, decreasing C_{Ti} implies an equivalent increase of P_{Ti}.

We find convenient to evaluate the consequences of a *coparticipación* reform on the basis of three different cases, a fixed exchange rate regime, a floating exchange rate regime with peso contracts and a floating exchange rate regime with dollar contracts.

(1) Fixed exchange rate regime :

In a hard peg, the need for countercyclical fiscal policy is strong, because monetary policy is left outside. In order to reform the tax-sharing principle, the federal government has to convince the provinces. However, R_i is invariant (fixed by contract) even if the royalties are paid in dollars. So, the dollarization of public contracts is innocuous on the local public finances.

The local government has to increase provincial taxes in order to compensate the decrease of *coparticipated* transfers. But if P_{Ti} rises, the demand for the private good decreases, because :

$$\frac{\partial c_i}{\partial P_{Ti}} < 0 \quad (22)$$

An uniform C_{Ti} cut / P_{Ti} increase is innocuous on the budget constraint of all individuals, but it increases their utility [see (14)] through a rise of the share of the provincial resources financed directly by provincial revenues.

(2) Floating exchange rate regime with Peso public contracts :

In a floating exchange rate regime, the currency is allowed to depreciate. However, with peso local public contracts, it doesn't imply any variation of R_i. So, for the local public finances the situation is the same than in the former case. The budget constraint of the individuals and their utility doesn't change, too.

(3) Floating exchange rate regime with Dollar public contracts :

In this case the currency of denomination of local public contracts matters. So, we have :

$$R_i = \begin{cases} R_i^* s & \text{if royalties are paid in dollars} \\ \overline{R_i} & \text{if royalties are paid in pesos} \end{cases}$$

Even if the royalties are paid in dollars, if the exchange rate is stable, like in industrial countries, the peso value of the commodity-induced resources is stable. However, in developing countries the nominal exchange rate tends to depreciate through time. This is particularly true in Latin America. From this "natural" rate of depreciation, the exchange rate is

relatively stable (sometimes, a moderate nominal appreciation) in good times, but very volatile in hard times (a sharp depreciation).

So, for the local government, if the exchange rate is allowed to float and if royalties are paid in dollar terms, commodity-induced resources serve to restraint the functional finance argument. For example, when the Argentinean peso was depreciated from 1 peso per 1 dollar to 3 pesos per 1 dollar, R_i grew 400 percent. So, the evolution of R_i is unambiguously countercyclical.

The more the peso depreciation is, the less the provincial taxes rise. So, since provincial taxes are negatively correlated with the demand for the private good, this demand is higher in the dollarization cum float equilibrium.

However, if the federal government doesn't allow the peso to float and/or the dollarization of public contracts, the local median voter preferences imply a non-cooperative choice of the local government and the failure of the *coparticipación* reform process. The *coparticipated* resources don't decrease (the dependence ratio is stable) which leads to federal and local fiscal profligacy, and to the temporary collapse of the tax-sharing principle and/or to the irreversible collapse of the hard peg. So, the exchange rate float, the local public contracts are dollarized and the tax-sharing system is in crisis.

When we compare these two situations, it appears clearly that the cooperative solution is more desirable. The non-cooperative equilibrium is the one experienced by Argentina in the late 2001.

Conclusion

The previous section gave an intuition for why the dollarization of local public contracts can endanger the sovereignty of the federal State. The choice of the exchange rate regime could be constrained endogenously by the decision making process of the *coparticipación* system reform. The recent (and some others) failure, in the nineties, of the *coparticipación* reform process implied a crisis of, both, local and federal public finances. Important vertical fiscal imbalances are associated with poor local tax collection. These two criteria were decisive in the issuance of provincial quasi-monies, in 2001 and 2002.

So, in the context of the end of the Convertibility, the new floating exchange rate regime has a countercyclical, disciplining, effect on the local public finances of the provinces with commodity-induced dollarized resources. But this is not the case of some important provinces, like the City of Buenos Aires, the province of Buenos Aires, the province of Santa Fe, or the province of Córdoba. These important provinces and the federal State borrowed in dolars during the nineties, in the context of a fixed exchange rate regime. But, since the *Banco Central de la Republica Argentina* allowed the peso to depreciate, the impact of debt dollarization on the balance sheets of the public sector changed dramatically. It justified the default of december 2001.

Overall, the opposite effects of dollarization, on the one hand, on the balance sheets of the provinces with commodity-induced resources and, on the other hand, on the balance sheets of the others public entities, may have some consequences on the *coparticipación* reform process. So, even if the actual process of debt *pesification* is necessary, it is not enough. In order to build a more sound and stable tax-sharing regime, the *pesification* of local public contracts is desirable.

REFERENCES

Armas A. and R. Webb (2002), "Monetary Policy in a Highly Dollarized Economy: The Case of Peru", IMF Conference "Challenges to Central Banking from Globalized Financial Systems", september

Blanc J. (2001), "Principe et Exercice de la Souveraineté Monétaire. Le Cas de l'Exclusivité Monétaire Nationale", mimeo

Bordo M. and M. Flandreau (2001), "Core, Periphery, Exchange Rate Regimes and Globalization", NBER, Working Paper.

Braun M., R. Hausmann et L. Pritchett (2003), "The Proliferation of Sovereigns: are there Lessons for Integration?", march, mimeo.

Chari V. V. and P. Kehoe (1998), "On the Need for Fiscal Constraints in a Monetary Union", Federal Reserve Bank of Minneapolis, Working Paper n° 589, august.

Cooper R. and H. Kempf (2001), "Dollarization and the conquest of hyperinflation in divided societies", Quarterly Review, (Sum) pp. 3-12. Federal Reserve Bank of Minneapolis.

Corden W. M. (2002), "Too Sensational: on the Choice of Exchange Rate Regimes", The MIT Press

Lora E. (2002), "A Decade of Structural Reforms in Latin America: What Has Been Reformed and How to Measure It?", IADB, mimeo.

Menger K. (1892), "On the Origin of Money", Economic Journal 2, pp. 238-255.

Panizza U. (1999), "On the Determinants of Fiscal Centralization: Theory and Evidence", Journal Of Public Economics, Vol. 74.

Saiegh S., P. Sanguinetti and M. Tommasi (2001), "Fiscal Federalism in Argentina: Policies, Politics and Institutional Reform", Economia, Vol. 1 (2), LACEA.

Saiegh S. and M. Tommasi (1999), "Why Is Argentina's Fiscal Federalism so Inefficient? Entering the Labyrinth", Journal of Applied Economics, Vol. 2 (1), CEMA.

Sanguinetti P., J. Sanguinetti and M. Tommasi (2000), "La Conducta Fiscal de los Gobiernos Municipales en Argentina: los Determinantes Económicos, Institucionales y Políticos", july, mimeo.

Schumpeter (1950), "History of Economic Analysis".

Schwartz G. and C. Liuksila (1997), "Argentina", in Ter-Minassian (ed.) "Fiscal Federalism in Theory and in Practice", IMF.

Tommasi M. (2002), "Federalism in Argentina and the Reforms of the 1990s", august, mimeo.

Figure 1. Provincial deficits, Poor Tax Collection and Vertical Fiscal Imbalance

National Resources / Total Resources (%)
Provincial Tax Income (as % of provincial GDP)
Provincial Deficit
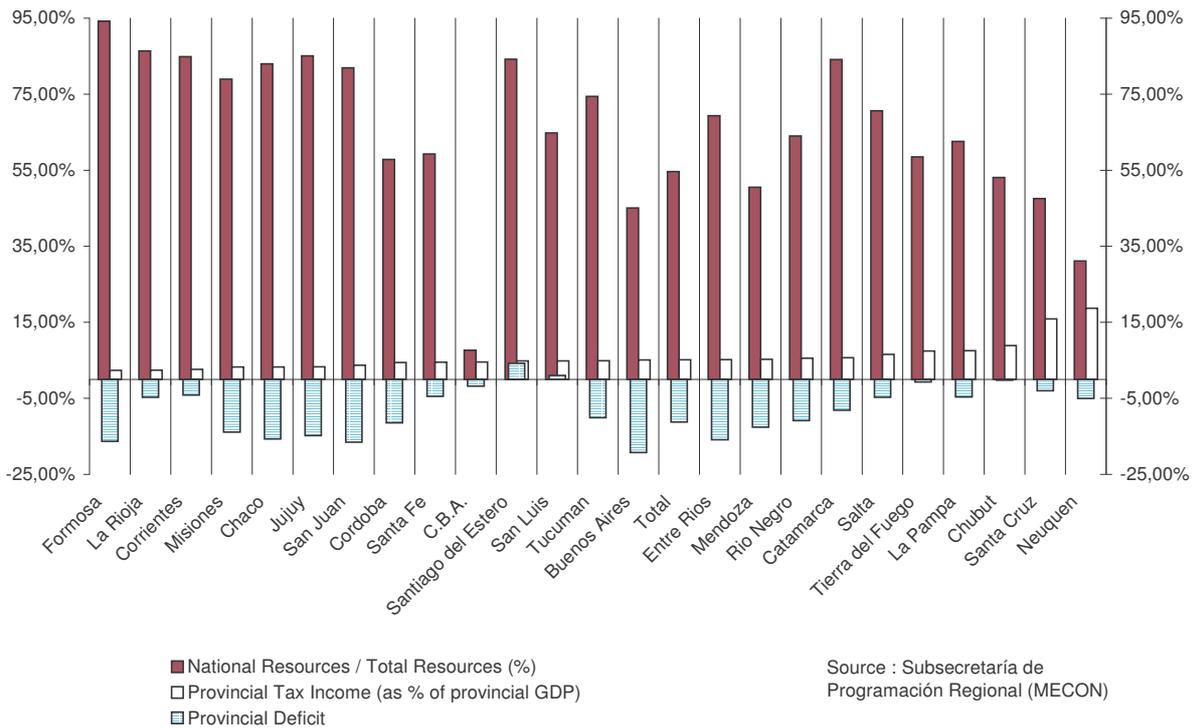
Notes : Arithmetic means on 1999-2002. Deficit as % of total income (does not include income from privatizations).

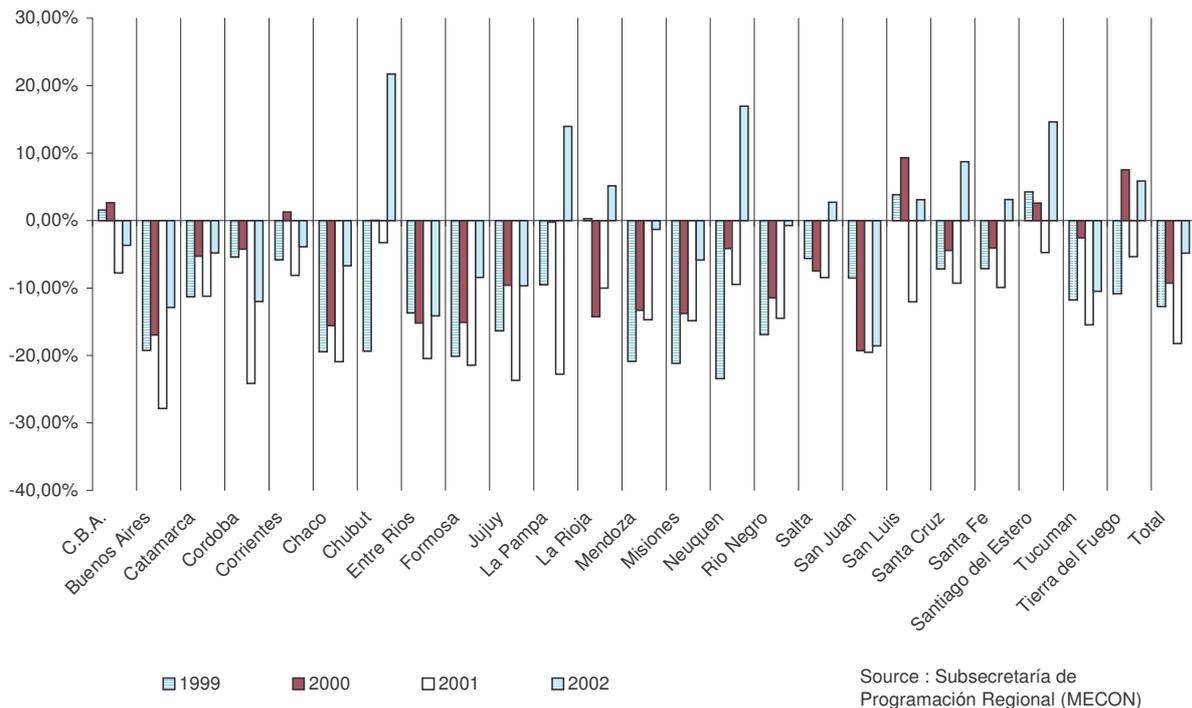Figure 2. Poor Tax Collection and Vertical Fiscal Imbalance
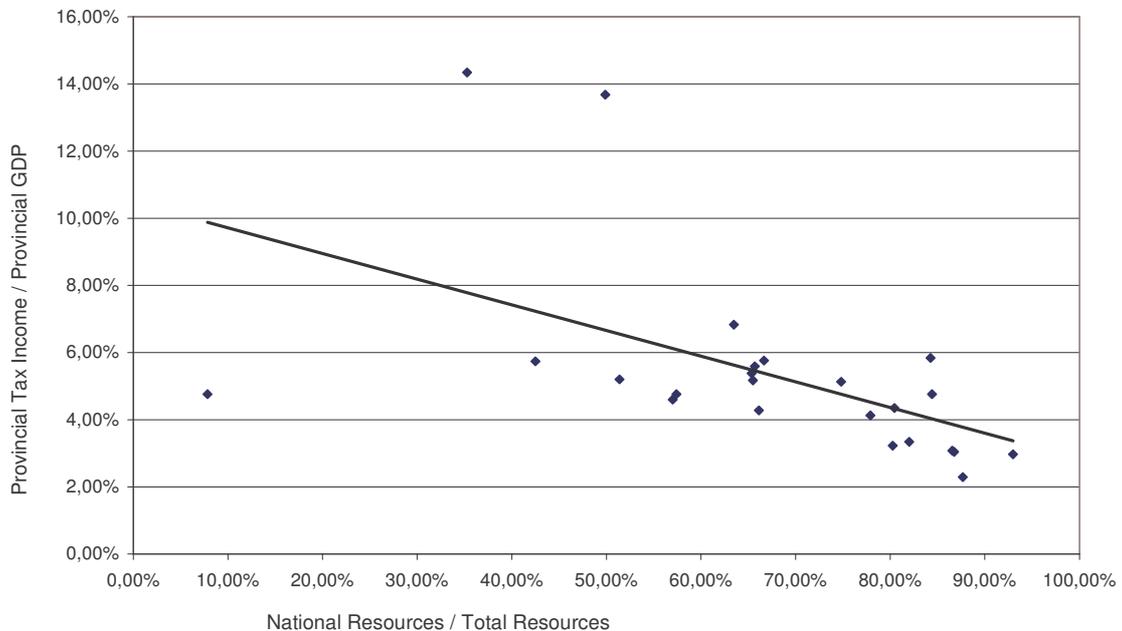
Note : The trendline represents the locus of the fitted values of a simple regression of the provincial tax collection ratio on the vertical fiscal imbalance ratio.

Figure 3. Provincial deficits


Source : Subsecretaría de Programación Regional (MECON)

Note : Deficit as % of total income (does not include income from privatizations).

Figure 4. Quasi Monies and Currency Circulation

Source : Centro de Estudios Bonaerenses
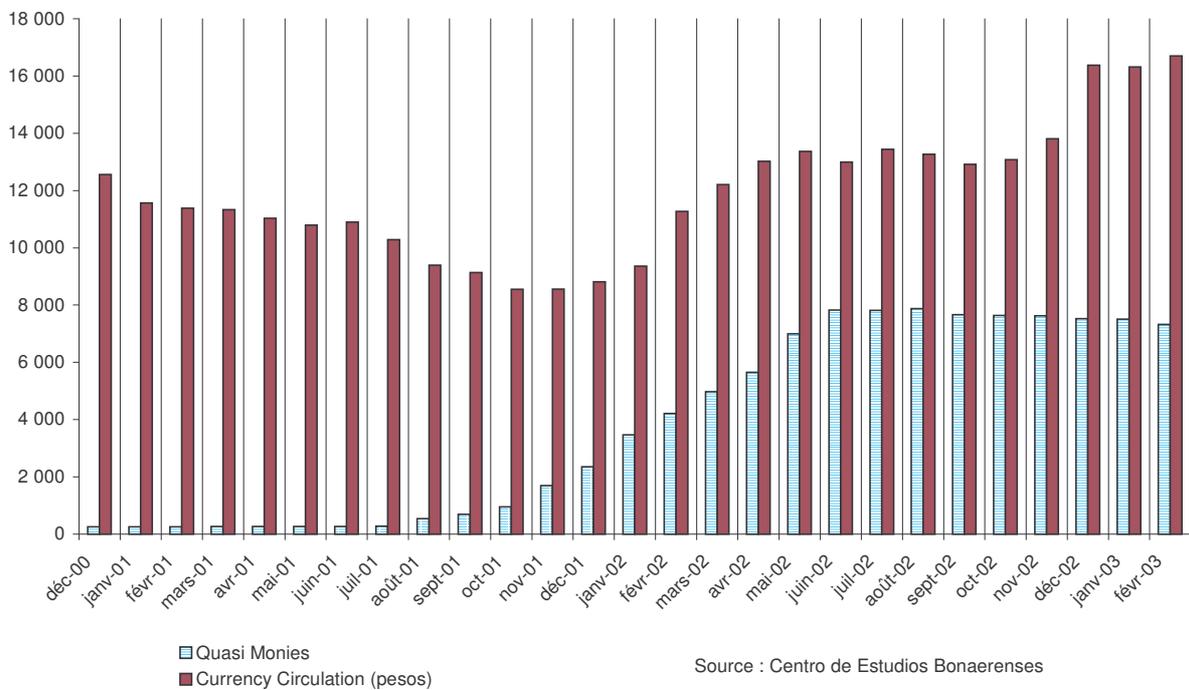
Note : Stocks, millions of pesos.

Figure 5. Deficit Reduction and Commodity Induced Resources

☐ 2001 Provincial Deficit [left]
■ 2002 Provincial Deficit [left]
▥ Commodity Induced Resources (percent change) [right]

Source : Subsecretaría de
Programación Regional (MECON)
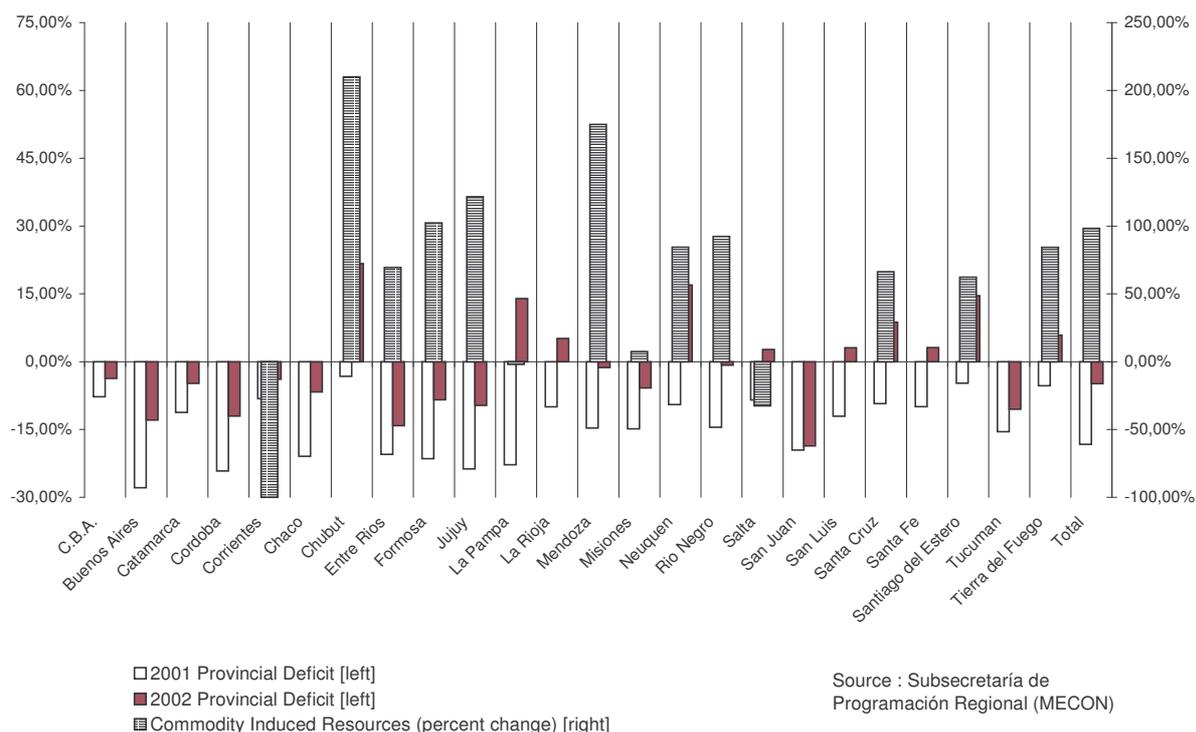
Note : Commodity Induced Resources, percent change 2002/2001.

Table 1. Quasi Monies and Currency Circulation (March 2003, millions of pesos)

Jurisdiction	Bond	Stock	Parity	Acceptance	Market Value
Buenos Aires	Patacones	2549	0,98 / 0,99	100%	2523,5
Catamarca	Bono Público	48	0,96 / 0,97	100%	46,6
Chaco	Quebracho	50	0,83 / 0,88	n/d	44
Córdoba	Lecor	586	0,93 / 0,97	100%	568,4
Corrientes	Cecacor	200	0,45 / 0,52	< 50%	104
Entre Rios	Federal	260	0,70 / 0,75	between 60 and 70%	195
Formosa	Bocanfor	50	0,80 / 0,85	70%	42,5
La Rioja	Bocade	10	n/d	100%	10
Mendoza	Petrom	74	0,90 / 0,95	100%	70,3
Nacion	Lecop	3300	0,98 / 0,99	100%	3267
Tucuman	Bocade	169	0,89 / 0,94	between 85 and 90%	158,9
Total		7296			7030,2

"Parity" corresponds to the quantity of pesos that an individual can obtain with one unity of quasi-money on the secondary market (November 2002 values). "Acceptance" corresponds to the purchasing power of each quasi-money. "Market Value" is the value of the stock of quasi-monies on the secondary market. n/d means no data.

Source : Centro de Estudios Bonaerense

Table 2. Quasi Monies and Currency Circulation (March 2003, millions of pesos)

Province	Provincial Issuance	as % of Total Currency Circulation	Provincial Issuance + Lecops	as % of Total Currency Circulation
Buenos Aires	2549	33%	3184	38%
Catamarca	48	36%	109	56%
Chaco	50	16%	216	45%
Chubut	/	/	57	19%
CBA	/	/	140	4%
Córdoba	586	30%	816	37%
Corrientes	200	61%	287	69%
Entre Rios	260	47%	378	56%
Formosa	50	34%	166	63%
Jujuy	/	/	122	43%
La Pampa	/	/	69	32%
La Rioja	10	7%	117	47%
Mendoza	74	8%	218	20%
Misiones	/	/	100	26%
Neuquen	/	/	98	28%
Rio Negro	/	/	76	23%
Salta	/	/	107	31%
San Juan	/	/	80	30%
San Luis	/	/	49	16%
Santa Cruz	/	/	96	39%
Santa Fe	/	/	268	17%
Santiago Del Estero	/	/	136	47%
Tierra Del Fuego	/	/	32	19%
Tucuman	169	32%	294	45%
Total	3996		7215	

Notes : "Total Currency Circulation" corresponds to pesos + quasi-monies provincial currency circulation. "Provincial Issuance + Lecops" corresponds to the real quantity of quasi-monies circulating in each province (Lecops are issued to pay *coparticipación* flows to the provinces).

Source : Own estimations from datas of the Centro de Estudios Bonaerense and of the Fondo Fiduciario para el Desarollo Provincial